

WHAT IS CLAIMED IS:

1. A method for supporting packet communications in an optical network, the method comprising:

receiving packet data at a synchronous optical network element; and

5 switching the packet data to a concentrated path, the concentrated path providing an optical link between the synchronous optical network element and a remote synchronous optical network element;

wherein switching comprises multiprotocol label switching to provide a virtual private network over a synchronous optical network.

10 2. The method of Claim 1, wherein receiving comprises receiving the packet data using an ethernet port of the synchronous optical network element.

15 3. The method of Claim 2, wherein the virtual private network links the ethernet port of the synchronous optical network element and an ethernet port of the remote synchronous optical network element.

20 4. The method of Claim 1, wherein a multiprotocol label switch (MPLS) stack delineates a plurality of MPLS paths for the virtual private network.

5. The method of Claim 4, further comprising mapping the packet data among the MPLS paths.

25 6. The method of Claim 5, wherein mapping comprises mapping based on ethernet media access control addresses included in the packet data.

7. The method of Claim 5, wherein mapping comprises mapping based on destination internet protocol addresses included in the packet data.

8. The method of Claim 1, wherein switching further comprises multiprotocol label switching to provide a plurality of virtual private networks over the synchronous optical network, the method further comprising:

5 routing the packet data based on label information distributed using label distribution protocol (LDP).

9. The method of Claim 1, wherein the concentrated path comprises an optical synchronous transport signal link between the synchronous optical network element and a remote synchronous optical network element.

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10. The method of Claim 1, wherein switching further comprises multiprotocol label switching to concentrate a plurality of label switched paths to the concentrated path.

11. A synchronous optical network element comprising:  
a local area network (LAN) interface operable to receive packet data;  
a synchronous optical add/drop multiplexer operable to couple the LAN  
interface to a synchronous optical network; and  
5 a multiprotocol label switch (MPLS) router operable to switch the packet data  
from the LAN interface to a concentrated path across the synchronous optical  
network, wherein switching comprises multiprotocol label switching to provide a  
virtual private network over the synchronous optical network.

10 12. The synchronous optical network element of Claim 11, wherein the  
concentrated path provides an optical link between the synchronous optical network  
element and a remote synchronous optical network element for the transmission of the  
packet data as MPLS traffic.

15 13. The synchronous optical network element of Claim 11, wherein the  
LAN interface comprises an ethernet port.

20 14. The synchronous optical network element of Claim 13, wherein the  
virtual private network links the ethernet port to an ethernet port of a remote  
synchronous optical network element.

15. The synchronous optical network element of Claim 11, wherein the  
MPLS router maintains an MPLS stack delineating a plurality of MPLS paths for the  
virtual private network.

25 16. The synchronous optical network element of Claim 15, wherein the  
MPLS router is further operable to map the packet data among the MPLS paths.

30 17. The synchronous optical network element of Claim 15, wherein the  
MPLS router is further operable to map the packet data based on ethernet media  
access control addresses included in the packet data.

18. The synchronous optical network element of Claim 15, wherein the MPLS router is further operable to map the packet data based on destination internet protocol addresses included in the packet data.

19. A synchronous optical network element comprising:
- an ethernet local area network (LAN) interface operable to receive packet data for a plurality of label switched paths;
- 5 a synchronous optical add/drop multiplexer operable to couple the ethernet LAN interface to a synchronous optical network; and
- a multiprotocol label switch (MPLS) router operable to switch the packet data from the LAN interface to a concentrated path across the synchronous optical network, wherein switching comprises multiprotocol label switching to provide a virtual private network over the synchronous optical network;
- 10 wherein the concentrated path provides an optical link between the synchronous optical network element and a remote synchronous optical network element for the transmission of the packet data as MPLS traffic, and wherein the virtual private network links the ethernet LAN interface to an ethernet port of the remote synchronous optical network element.
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20. The synchronous optical network element of Claim 19, wherein the MPLS router is further operable to maintain an MPLS stack delineating the label switched paths for the virtual private network.